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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,999	06/06/2001	Hiroyuki Suzuki	35.C15413	7495

5514 7590 06/14/2005

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER	
CULBERT, ROBERTS P	

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/873,999	SUZUKI, HIROYUKI	
	Examiner	Art Unit	
	Roberts Culbert	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *18-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 10-17* is/are rejected.

7)☒ Claim(s) *8 and 9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group I (Claims 1-17) in the reply filed on 4/5/05 is acknowledged. The traversal is on the ground(s) that all claims could be searched without undue effort. This is not found persuasive because the searches for the restricted groups do not overlap and examination of all claims would require undue effort.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 14, 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,040,896 to Harrington et al.

Regarding Claims 1 and 17, Harrington et al. teach a method of manufacturing an optical element comprising the stages of: machining a substrate (Col. 2, Lines 58); removing a contamination from a surface of the substrate after the machining (Col. 2, Lines 59-65); and removing a deterioration layer (irregularities) in the surface of the substrate after the machining using a chemical polish (Col. 2, Line 66 – Col. 3, Line 52).

Regarding Claim 2, Harrington et al. teach that the substrate is made from CaF_2 single crystal. (Col. 1, Lines 40-45)

Regarding Claim 14, Harrington et al. teach that the contamination is one of abrasive, oil and other foreign matter. (Col. 2, Lines 59-62)

Regarding Claim 16, Harrington et al teach that the CaF_2 single crystal may be used for a laser window (transparent plate). See (Col. 2, Lines 17-30)

Claims 1, 3, 4 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,742,026 to Dickinson Jr. et al.

Regarding Claims 1, 3, 4 and 17, Dickinson Jr. et al. teaches a method of manufacturing an optical element comprising the stages of: machining (lapping) a substrate (Col. 5, Lines 19-21) removing a contamination from a surface of the substrate after the machining by focusing a KrF excimer laser (Col. 4, Lines 29-33) on the surface of the substrate, and removing a deterioration (damaged) layer in the surface of the substrate after the machining (Col. 1, Lines 55-60)

Claims 1-3, 14 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,375,551 to Darcangelo et al.

Regarding Claims 1-3, 14 and 17, Darcangelo et al. teaches a method of manufacturing an optical element comprising the stages of: machining (polishing) a CaF_2 crystal substrate (Col. 3, Lines 63-65), removing a contamination from a surface of the substrate after the machining by focusing an excimer laser (Col. 4, Lines 11-17) on the surface of the substrate, and removing a deterioration layer in the surface of the substrate after the machining (Col. 1, Lines 55-60)

Note that the step of cleaning (Col. 5, Lines 38-43) also reads on the step of removing a contamination as broadly claimed by applicant in claim 1.

Regarding Claim 14, Darcangelo et al. teaches that the contamination is one of abrasive, oil and other foreign matter. (Col. 7, Lines 38-41)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-7 and 14-17 are rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent Application Publication 2001/0001686 to Kishida et al. in view of U.S. Patent 6,217,665 to Suzuki.

Regarding Claims 1, 3-5 and 17, Kishida et al. teaches that prior to production of an LCD (optical element), a glass substrate is machined (cut) from a larger glass sheet or plate glass. (Paragraph 6)

Kishida et al. do not teach removing a contamination or deterioration layer after machining the glass substrate.

Suzuki teaches a method of manufacturing an LCD (optical element) comprising the stages of: removing a contamination from a surface of the substrate by focusing a KrF excimer laser (Col. 2, Lines 49-57) on the surface of the substrate, and removing a deterioration layer in the surface of the substrate using ultrasonic washing with an aqueous wash solution (Col. 3, Lines 33-41).

It would have been obvious to one of ordinary skill in the art at the time of invention to perform the cleaning steps of Suzuki after machining the glass substrate of Kishida et al. in order to remove contaminants from the surface of the glass as taught by Suzuki.

Regarding Claim 6, Suzuki does not explicitly teach ultrasonic cleaning step with a wash solution containing a surface-active agent and a step of ultrasonic washing with pure water performed in succession.

However, Suzuki teaches that it is known in the crystalline substrate cleaning art that ultrasonic cleaning may be improved by performing a first ultrasonic washing step with a wash solution containing a surface-active agent (detergent) and a second step of ultrasonic washing with pure water. (Col. 1, Lines

55-60) It would have been obvious to one of ordinary skill in the art at the time of invention to perform the two-step process of the prior art, in order to reduce the processing time as taught by Suzuki.

Regarding Claim 7, Suzuki teaches drying the rinsed substrate after the surface of the substrate is ultrasonic washed with pure water. (Col. 3, Lines 39-41)

Regarding Claim 14, Suzuki teaches the contamination is abrasive, oil and other foreign matter. (Col. 2, Lines 27-49)

Regarding Claim 15, Suzuki does not explicitly teach the surface roughness, however, since the method steps of machining, exposing with a KrF excimer laser and ultrasonic washing are the same, the roughness would be the same in Suzuki, or else arises from essential limitations not present in the claim.

Regarding Claim 16, Suzuki teaches that the optical element is a transparent plate. (Col .3, Lines 28-30)

Claim 10 is rejected under 35 U.S.C. 103(a) as being obvious over U.S. **Patent Application Publication 2001/0001686 to Kishida et al. in view of U.S. Patent 6,217,665 to Suzuki as applied above to claims 1, 3-7 and 14-17 and in further view of U.S Patent 5,334,258 to Osano et al.**

As applied above, Kishida et al. in view of Suzuki teaches the method of the invention substantially as claimed, but do not teach using an alkalescent surface-active agent.

However, Osano et al teach that a preferred surfactant for the ultrasonic washing of optical parts is an alkalescent surface-active agent. (Col. 6, Lines 1-10)

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to use an alkalescent surface-active agent in the ultrasonic wash of Suzuki in order to provide a suitable type surfactant for the ultrasonic washing of optical parts.

Claim 11 is rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent Application Publication 2001/0001686 to Kishida et al. in view of U.S. Patent 6,217,665 to Suzuki as applied above to claims 1, 3-7 and 14-17 and in further view of U.S Patent 5,468,346 to Bruce et al.

As applied above, Kishida et al. in view of Suzuki teaches the method of the invention substantially as claimed, but do not teach that the step of drying is performed with warm air. Suzuki teaches drying the substrate after rinsing with isopropyl vapor. (Col. 3, Lines 38-41)

However, Bruce et al. teach that isopropyl alcohol drying and warm-air drying are equivalent methods of drying a glass substrate after a pure water rinse.

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to use the warm air drying method of Bruce et al. to dry the glass substrate of Suzuki, because Bruce et al. show that isopropyl drying and warm-air drying are art-recognized equivalents for the purpose of drying glass substrates after a pure water rinse, and it has been held that substitution of one art-recognized equivalent for another is prima facie obvious. See *In re Fout*, 297, 213 USPQ 532 (CCPA 1982).

Claim 12 is rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent 4,040,896 to Harrington et al. in view of U.S Patent 6,238,479 to Oba.

As applied above, Harrington et al. teaches the method of the invention substantially as claimed, but do not teach that the machining stage comprises cutting the substrate from CaF_2 single crystalline base substrate and polishing the surface with a predetermined shape.

However, it is old in the art of forming crystalline optical elements to cut and polish optical shapes from a larger crystalline base substrate. For example, Oba teaches that it is known to cut CaF_2 single crystalline optical parts from a larger substrate made of the same material. (Col. 10, Lines 27-33)

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to use the rough shaping method of Oba to provide the crystalline substrate in the method of Harrington et al. in order to provide a suitably shaped starting substrate for the formation of CaF_2 single crystalline optical parts.

Claim 13 is rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent 4,040,896 to Harrington et al. in view of U.S Patent 6,238,479 to Oba as applied above to claim 12, and in further view of JP 63222023 A to Yamamoto.

As applied above, Harrington et al. teaches the method of the invention substantially as claimed, but do not teach the machining step includes forming a protective film on the polished surface of a substrate before the contamination-removing step.

Yamamoto teaches forming a protective carbon film on a polished lens surface before a machining or polishing step and afterwards removing the thin protective film. (See Abstract)

It would have been obvious to one of ordinary skill in the art at the time of invention to form a protective layer as shown by Yamamoto in order to shape an optical element with increased production and reduced time as taught by Yamamoto.

Allowable Subject Matter

Claims 8 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach render obvious a method of manufacturing an optical element comprising machining a substrate, removing a contamination from the substrate surface after machining, and removing a deterioration layer in the surface after the machining, wherein the contamination removing step comprises immersing the substrate in acetone taking out the substrate from the acetone, wiping the surface thereof with a paper containing diamond powder, processing the wiped surface with solvent and processing the surface-processed substrate with UV/O_3.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

P.L

PARVIZ HASSANZADEH
SUPERVISORY PATENT EXAMINER

R. Culbert